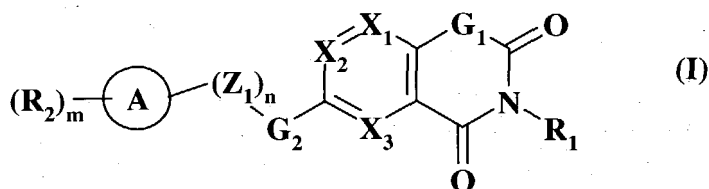


**CLAIMS**

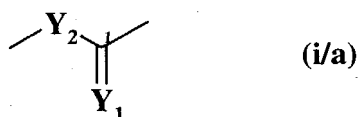
What is claimed is:

1- A compound of formula (I):



wherein:

- 5     •  $X_1$ ,  $X_2$ , and  $X_3$ , independently of each other, represent a nitrogen atom or a group  $-CR_3$  in which  $R_3$  represents a group selected from hydrogen,  $(C_1-C_6)$ alkyl, amino, mono $(C_1-C_6)$ alkylamino, di $(C_1-C_6)$ alkylamino, hydroxy,  $(C_1-C_6)$ alkoxy, and halogen, it being understood that not more than two of the groups  $X_1$ ,  $X_2$  and  $X_3$  simultaneously represent a nitrogen atom,
- 10     •  $G_1$  represents an oxygen atom or a group  $S(O)_p$  in which  $p$  represents an integer from 0 to 2 inclusive,
- $G_2$  represents a group selected from carbon-carbon triple bond,  $C=O$ ,  $C=S$ ,  $S(O)_q$  in which  $q$  represents an integer from 0 to 2 inclusive, or a group of formula (i/a):



- 15     in which the carbon atom with the number 1 is attached to the bicyclic system of the compound of formula (I),  $Y_1$  represents a group selected from oxygen, sulphur,  $-NH$  and  $-N(C_1-C_6)$ alkyl, and  $Y_2$  represents a group selected from oxygen, sulphur,  $-NH$  and  $-N(C_1-C_6)$ alkyl,

- $n$  represents an integer from 0 to 6 inclusive,
- 20     •  $Z_1$  represents  $-CR_4R_5$ , wherein  $R_4$  and  $R_5$ , identical or different independently of each other, represent a group selected from hydrogen,  $(C_1-C_6)$ alkyl, trihalogeno $(C_1-C_6)$ alkyl, halogen, amino, mono $(C_1-C_6)$ alkylamino, di $(C_1-C_6)$ alkylamino in which each alkyl moiety

is identical or different,  $-OR_6$ ,  $-SR_6$ , and  $-C(=O)OR_6$ , in which  $R_6$  is hydrogen atom or  $(C_1-C_6)$ alkyl, and

- wherein when  $n$  is greater than or equal to 2, the hydrocarbon chain  $Z_1$  optionally contains one to two isolated or conjugated multiple bonds,

5 - and/or wherein when  $n$  is greater than or equal to 2 one of said  $-CR_4R_5$  may be replaced with a group selected from oxygen,  $S(O)_r$  in which  $r$  represents an integer from 0 to 2 inclusive,  $-NH$  and  $-N(C_1-C_6)$ alkyl,

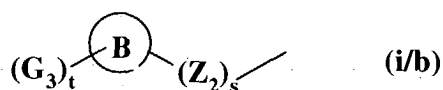
10 •  $A$  represents a group selected from aryl, heteroaryl, cycloalkyl, and heterocycloalkyl, these groups being a 5- or 6-membered monocycle, or bicycle itself composed of two 5- or 6-membered monocycles,

•  $R_1$  represents a group selected from :

- hydrogen,

15 -  $(C_1-C_6)$ alkyl,  $(C_2-C_6)$ alkenyl,  $(C_2-C_6)$ alkynyl, these groups may be optionally substituted with one or more groups, which may be identical or different independently of each other, selected from amino, cyano, trihalogeno $(C_1-C_6)$ alkyl, cycloalkyl,  $-C(=O)NR_7R_8$ ,  $-C(=O)OR_7$ ,  $OR_7$ , and  $SR_7$ , in which  $R_7$  and  $R_8$ , which may be identical or different independently of each other, represent hydrogen or  $(C_1-C_6)$ alkyl,

- and the group of formula (i/b) :



20

✓ in which  $s$  is an integer from 0 to 8 inclusive,

✓  $Z_2$  represents  $-CR_9R_{10}$  wherein  $R_9$  and  $R_{10}$ , identical or different independently of each other, represent a group selected from hydrogen,  $(C_1-C_6)$ alkyl, phenyl, trihalogeno $(C_1-C_6)$ alkyl, halogen, amino,  $OR_6$ ,  $SR_6$  and  $-C(=O)OR_6$  in which  $R_6$  is as defined hereinbefore, and

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- wherein when  $s$  is greater than or equal to 2, the hydrocarbon chain  $Z_2$  optionally contains one or two isolated or conjugated multiple bonds,

- and/or wherein when p is greater or equal to 2, one of said  $-\text{CR}_9\text{R}_{10}$  may be replaced with a group selected from oxygen,  $\text{S}(\text{O})_u$  in which u is an integer from 0 to 2 inclusive,  $-\text{NH}$ ,  $-\text{N}(\text{C}_1\text{-C}_6)\text{alkyl}$ , and carbonyl,

✓ B represents a group selected from aryl, heteroaryl, cycloalkyl, and heterocycloalkyl, these groups being a 5- or 6-membered monocycle, or bicycle itself composed of two 5- or 6-membered monocycles,

✓ t is an integer from 0 to 7 inclusive,

✓ the group(s)  $\text{G}_3$ , which may be identical or different independently of each other, is (are) selected from  $(\text{C}_1\text{-C}_6)\text{alkyl}$ , halogen,  $\text{CN}$ ,  $\text{NO}_2$ ,  $\text{CF}_3$ ,  $\text{OCF}_3$ ,  $-(\text{CH}_2)_k\text{NR}_{11}\text{R}_{12}$ ,  $-\text{N}(\text{R}_{11})\text{C}(=\text{O})\text{R}_{12}$ ,  $-\text{N}(\text{R}_{11})\text{C}(=\text{O})\text{OR}_{12}$ ,  $-\text{N}(\text{R}_{11})\text{SO}_2\text{R}_{12}$ ,  $-\text{N}(\text{SO}_2\text{R}_{11})_2$ ,  $-\text{OR}_{11}$ ,  $-\text{S}(\text{O})_{k1}\text{R}_{11}$ ,  $-\text{SO}_2\text{-N}(\text{R}_{11})\text{-(CH}_2\text{)}_{k2}\text{-NR}_{12}\text{R}_{13}$ ,  $-(\text{CH}_2)_k\text{SO}_2\text{NR}_{11}\text{R}_{12}$ ,  $-\text{X}_4(\text{CH}_2)_k\text{C}(=\text{O})\text{OR}_{11}$ ,  $-(\text{CH}_2)_k\text{C}(=\text{O})\text{OR}_{11}$ ,  $-\text{C}(=\text{O})\text{O}-(\text{CH}_2)_{k2}\text{-NR}_{11}\text{R}_{12}$ ,  $-\text{C}(=\text{O})\text{O}-(\text{CH}_2)_{k2}\text{-C}(=\text{O})\text{OR}_{14}$ ,  $-\text{X}_4(\text{CH}_2)_k\text{C}(=\text{O})\text{NR}_{11}\text{R}_{12}$ ,  $-(\text{CH}_2)_k\text{C}(=\text{O})\text{NR}_{11}\text{R}_{12}$ ,  $-\text{R}_{15}\text{-C}(=\text{O})\text{OR}_{11}$ ,  $-\text{X}_5\text{-R}_{16}$ , and  $-\text{C}(=\text{O})\text{-R}_{17}\text{-NR}_{11}\text{R}_{12}$  in which :

-  $\text{X}_4$  represents a group selected from oxygen, sulphur optionally substituted by one or two oxygen, and nitrogen substituted by a hydrogen or a  $(\text{C}_1\text{-C}_6)\text{alkyl}$  group,

- k is an integer from 0 to 3 inclusive,

-  $k_1$  is an integer from 0 to 2 inclusive,

-  $k_2$  is an integer from 1 to 4 inclusive,

-  $\text{R}_{11}$ ,  $\text{R}_{12}$  and  $\text{R}_{13}$ , which may be identical or different independently of each other, are selected from hydrogen and  $(\text{C}_1\text{-C}_6)\text{alkyl}$ ,

-  $\text{R}_{14}$  represents a group selected from  $(\text{C}_1\text{-C}_6)\text{alkyl}$ ,  $-\text{R}_{17}\text{-NR}_{11}\text{R}_{12}$ ,  $-\text{R}_{17}\text{-NR}_{11}\text{-C}(=\text{O})\text{-R}_{17}\text{-NR}_{12}\text{R}_{13}$ , and  $-\text{C}(=\text{O})\text{O-R}_{17}\text{-NR}_{11}\text{R}_{12}$  in which  $\text{R}_{17}$  represents a

linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene group, and R<sub>11</sub>, R<sub>12</sub> and R<sub>13</sub> are as defined hereinbefore,

- R<sub>15</sub> represents a (C<sub>3</sub>-C<sub>6</sub>)cycloalkyl group,
- X<sub>5</sub> represents a group selected from a single bond, -CH<sub>2</sub>-, oxygen, sulphur optionally substituted by one or two oxygen, and nitrogen substituted by hydrogen or (C<sub>1</sub>-C<sub>6</sub>)alkyl,
- R<sub>16</sub> represents a group selected from :
  - o a 5- or 6-membered monocyclic aryl or heteroaryl, which is optionally substituted by one or more groups, which may be identical or different independently of each other, selected from (C<sub>1</sub>-C<sub>6</sub>)alkyl, halogen, hydroxy, cyano, tetrazolyl, amino, and -C(=O)OR<sub>7</sub> wherein R<sub>7</sub> represents hydrogen or (C<sub>1</sub>-C<sub>6</sub>)alkyl,
  - o and a 5- or 6-membered monocyclic cycloalkyl or heterocycloalkyl, which is optionally substituted by one or more groups, which may be identical or different independently of each other, selected from (C<sub>1</sub>-C<sub>6</sub>)alkyl, halogen, hydroxy, oxo, cyano, tetrazolyl, amino, and -C(=O)OR<sub>7</sub> wherein R<sub>7</sub> represents hydrogen or (C<sub>1</sub>-C<sub>6</sub>)alkyl,
- m is an integer from 0 to 7 inclusive,
- the group(s) R<sub>2</sub>, which may be identical or different independently of each other, is (are) selected from (C<sub>1</sub>-C<sub>6</sub>)alkyl, halogen, -CN, -NO<sub>2</sub>, -SCF<sub>3</sub>, -CF<sub>3</sub>, -OCF<sub>3</sub>, -NR<sub>7</sub>R<sub>8</sub>, -OR<sub>7</sub>, -SR<sub>7</sub>, -SOR<sub>7</sub>, -SO<sub>2</sub>R<sub>7</sub>, -(CH<sub>2</sub>)<sub>k</sub>SO<sub>2</sub>NR<sub>7</sub>R<sub>8</sub>, -X<sub>7</sub>(CH<sub>2</sub>)<sub>k</sub>C(=O)OR<sub>7</sub>, -(CH<sub>2</sub>)<sub>k</sub>C(=O)OR<sub>7</sub>, -X<sub>7</sub>(CH<sub>2</sub>)<sub>k</sub>C(=O)NR<sub>7</sub>R<sub>8</sub>, -(CH<sub>2</sub>)<sub>k</sub>C(=O)NR<sub>7</sub>R<sub>8</sub>, and -X<sub>8</sub>-R<sub>18</sub> in which:
  - X<sub>7</sub> represents a group selected from oxygen, sulphur optionally substituted by one or two oxygen, and nitrogen substituted by hydrogen or (C<sub>1</sub>-C<sub>6</sub>)alkyl,
  - k is an integer from 0 to 3 inclusive,

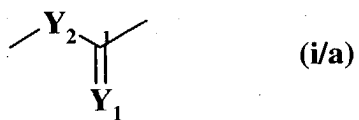
- R<sub>7</sub> and R<sub>8</sub>, which may be identical or different independently of each other, are selected from hydrogen and (C<sub>1</sub>-C<sub>6</sub>)alkyl,
- X<sub>8</sub> represents a group selected from single bond, -CH<sub>2</sub>-, oxygen, sulphur optionally substituted by one or two oxygen, and nitrogen substituted by hydrogen or (C<sub>1</sub>-C<sub>6</sub>)alkyl,
- R<sub>18</sub> represents a group selected from phenyl, a 5- or 6-membered monocyclic, heteroaryl, and a 5- or 6-membered monocyclic cycloalkyl, each of these groups being optionally substituted by one or more groups, which may be identical or different independently of each other, selected from (C<sub>1</sub>-C<sub>6</sub>)alkyl, halogen, hydroxy and amino,

or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof,

wherein the compound of formula (I) is not 6-(2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine)-benzoate, 6-phenylthio-2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine, 6-benzylsulphonyl-2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine, 6-benzophenone-2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine or 6-(2,4-dihydroxy)-benzophenone-2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine.

2- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein :

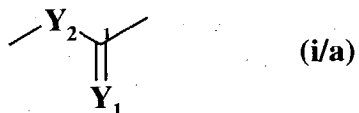
- G<sub>1</sub> represents a sulphur atom,
- G<sub>2</sub> represents a group of formula (i/a):



in which the carbon atom with the number 1 is attached to the bicycle of the compound of formula (I), Y<sub>1</sub> represents an oxygen atom, and Y<sub>2</sub> represents a group -NH, X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, n, Z<sub>1</sub>, A, R<sub>1</sub>, m and R<sub>2</sub> are as defined in formula (I).

3- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein :

- $G_1$  represents an oxygen atom,
- $G_2$  represents a group of formula (i/a):



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in which the carbon atom with the number 1 is attached to the bicycle of the compound of formula (I),  $Y_1$  represents an oxygen atom, and  $Y_2$  represents a group -NH,  
 $X_1, X_2, X_3, n, Z_1, A, R_1, m$  and  $R_2$  are as defined in formula (I).

10 4- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein :

- $G_1$  represents a sulphur atom,
- $G_2$  represents a carbon-carbon triple bond,
- $n$  represents an integer from 1 to 6 inclusive,

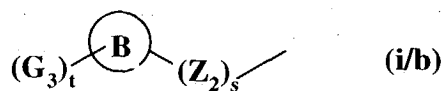
$X_1, X_2, X_3, Z_1, A, R_1, m$  and  $R_2$  are as defined in formula (I).

15 5- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein :

- $G_1$  represents an oxygen atom,
- $G_2$  represents a carbon-carbon triple bond,
- $n$  represents an integer from 1 to 6 inclusive,

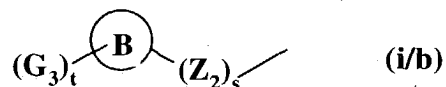
20  $X_1, X_2, X_3, Z_1, A, R_1, m$  and  $R_2$  are as defined in formula (I).

6- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein  $R_1$  represents a group of formula (i/b):



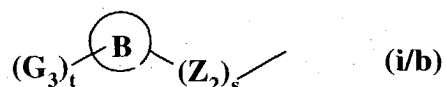
wherein  $Z_2, s, B, G_3$  and  $t$  are as defined in the compound of formula (I).

7- The compound according to claim 6, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein  $R_1$  represents a group of formula (i/b):



wherein  $Z_2$  represents a group  $-\text{CR}_9\text{R}_{10}$  in which  $R_9$  and  $R_{10}$  represents each a hydrogen atom,  $s$  is equal to one, and  $B$ ,  $G_3$ , and  $t$  are as defined in the compound of formula (I).

8- The compound according to claim 7, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein  $R_1$  represents a group of formula (i/b):



wherein  $B$  represents a phenyl group,  $t$  is equal to 0 or 1, and  $G_3$ , when it is present, represents a group selected from  $\text{OR}_{11}$ , halogen, and  $(\text{CH}_2)_k\text{C}(=\text{O})\text{OR}_{11}$  in which  $R_{11}$  represents an hydrogen atom or a  $(\text{C}_1\text{-C}_6)$ alkyl group and  $k$  is equal to zero.

9- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein  $X_1$ ,  $X_2$ , and  $X_3$  represent each a group  $-\text{CR}_3$  in which  $R_3$  represents a hydrogen atom.

10- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein  $X_1$  represents a group  $-\text{CR}_3$  in which  $R_3$  represents a hydrogen atom,  $X_2$  represents a nitrogen atom or a group  $-\text{CR}_3$  in which  $R_3$  represents a hydrogen atom, and  $X_3$  represents a group  $-\text{CR}_3$  in which  $R_3$  represents a hydrogen atom.

11- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein  $Z_1$  represents  $-\text{CR}_4\text{R}_5$  in which  $R_4$  and  $R_5$  represent each a hydrogen atom, and  $n$  is equal to one.

12- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein  $A$  represents a phenyl group,  $m$  is equal to zero or one, and  $R_2$  represents a  $(\text{C}_1\text{-C}_6)$ alkoxy group or a hydrogen atom.

13- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein A represents a pyridyl group, m is equal to zero or one, and R<sub>2</sub> represents a (C<sub>1</sub>-C<sub>6</sub>)alkoxy group or a hydrogen atom.

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14- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein A represents an imidazolyl group.

15- The compound according to claim 1 selected from:

- 10 - 3-benzyl-2,4-dioxo-3,4-dihydro-2*H*-benzo[*e*][1,3]thiazine-6-carboxylic acid 4-methoxy benzylamide;
- 3-(4-methoxybenzyl)2,4-dioxo-3,4-dihydro-2*H*-benzo[*e*][1,3]oxazine-6-carboxylic acid 4-methoxybenzylamide;
- and 4-[2,4-dioxo-6-(3-phenyl-prop-1-ynyl)-4*H*-1,3-benzothiazin-3-ylmethyl]-benzoic acid; or
- 15 a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof.

16- A method for treating a patient afflicted with a disease or disorder that is mediated by a MMP-13 enzyme, comprising administering to the patient an effective amount of a compound of claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof.

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17- The method according to Claim 16, wherein the disease or disorder is selected from arthritis, rheumatoid arthritis, osteoarthritis, osteoporosis, periodontal diseases, inflammatory bowel disease, psoriasis, multiple sclerosis, cardiac insufficiency, atherosclerosis, asthma, chronic obstructive pulmonary disease, age-related macular degeneration, and cancer.

25

18- The method according to Claim 17, wherein the disease or disorder is arthritis.

19- The method according to Claim 18, wherein the disease or disorder is rheumatoid arthritis or osteoarthritis.



20- A pharmaceutical composition comprising as active ingredient an effective amount of a compound as claimed in claim 1, in combination with a pharmaceutically acceptable excipient or carrier.

5 21- The pharmaceutical composition according to Claim 20, wherein the compound as claimed in claim 1 is a compound according to claim 2 or 4.